

THE SYSTEMATIC STATUS OF *SYRRHOPHUS*
JUNINENSIS SHREVE (ANURA: LEPTODACTYLIDAE)

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Abstract.—*Syrrhophus juninensis* Shreve is shown to be referable to the genus *Phrynopus* of the tribe Eleutherodactylini, rather than its current placement in *Telmatobius* of the Telmatobiini. The species is known from the departments of Junín and Pasco in central Andean Peru.

Shreve (1938) described *Syrrhophus juninensis* and *Syrrhophus montium* from Cascas, Peru. He noted that both species possessed a broad cartilaginous sternum and T-shaped terminal phalanges, but lacked prevomerine teeth. At that time, these characters defined the genus *Syrrhophus*.

Most of the South American *Syrrhophus* were referred to *Eleutherodactylus* in the years that followed the publication of Gorham's (1966) checklist. The species *montium* was placed in *Niceforonia* by Lynch (1968) and ultimately in *Phrynopus* (Lynch, 1975). However, the history of the species *juninensis* is more confused. Lynch (1968) transferred the species to *Eupsophus*, noting that it was similar to *Eupsophus peruanus* and *E. wettsteini*. He cited several osteological and morphological characters to support his opinion, but did not list any specimens examined. He followed this opinion in his 1970 revision of the genus *Syrrhophus*, and in his monograph of the Leptodactylidae (1971). However, in Lynch (1969) he had previously moved *wettsteini* to the genus *Niceforonia* without explanation, retaining *juninensis* and *peruanus* in *Eupsophus*.

Lynch's (1972) redefinition and partition of *Eupsophus* retained *juninensis* in the genus and supported the transfer of *wettsteini* to the genus *Niceforonia* on osteological features. The poorly known species *peruanus* was retained provisionally in *Eupsophus*. Lynch stated that he had examined skeletons of *juninensis*, presumably MCZ 24360. In his 1975 revision, Lynch placed the genus *Niceforonia* under the synonymy of *Phrynopus*, thus the species *wettsteini* became *Phrynopus wettsteini*. The species *peruanus* was also transferred from *Eupsophus* to *Phrynopus*.

Finally, Lynch (1978) transferred *juninensis* to *Telmatobius* in his analysis of relationships of the lower telmatobiine frogs. He provided no data to support this conclusion, other than the statement (page 51) "Osteologically, *juninensis* agrees with *Telmatobius* rather than *Alsodes* or *Eupsophus*."

I have examined the holotype and some paratypes of *Syrrhophus juninensis*, and conclude that it is referable to the genus *Phrynopus*. Fourteen of the species in the genus were discussed by Lynch (1975), and two more were described by Cannatella (1984).

Phrynopus juninensis (Shreve), new combination

Fig. 1

Holotype.—MCZ (Museum of Comparative Zoology) 22851, male, snout-vent length (SVL) = 30.6 mm, from "Cascas near Huasihuasi, Department of Junin, Peru."



Fig. 1. Dorsal and ventral views of *Phrynopus juninensis*, female, KU 138880, SVL = 41.3 mm.

Paratypes. — MCZ 22852–7, same locality data as the holotype. I have examined MCZ 22852–53; José Rosado of the MCZ informed me that 22854–57 were traded to the Field Museum of Natural History, E. H. Taylor, the University of Michigan Museum of Zoology, and the British Museum (Natural History), respectively.

Referred specimens. — MCZ 24360–61, 24009–10; KU 138880–81.

Diagnosis. — (format of Lynch, 1975) A large species of *Phrynopus* (male SVL 22.0–30.6 mm, female 41.3 mm); skin of dorsum smooth or barely areolate; venter smooth; thumb about equal in length to second finger; toes lacking basal webbing and lateral fringes; two metatarsal tubercles, outer much smaller than inner; tarsus lacking tubercles or fold; tympanum, tympanic annulus, and middle ear structures absent; snout rounded in lateral profile; vocal slits absent; prevomerine teeth absent, dentigerous ramus thin, sliver-like; frontoparietals widely separated, lacking crests; nasals small, separated medially; anterior ramus of parasphenoid not reaching level of palatines; median ramus of pterygoid narrowly separated from parasphenoid ala; in life, dark brown above and below with tan spots above and silvery-white flecks below; lips pale grayish tan with dark brown bars; iris bronze (KU 138880–81).

Justification of taxonomy. — The above systematic rearrangement requires some explanation, especially because *Telmatobius* is in the tribe Telmatobiini and *Phrynopus* is a member of the tribe Eleutherodactylini. Lynch (1971) noted there are no morphological features that define the Eleutherodactylini; however, those genera for which data are available have direct development. Many of the genera have T-shaped terminal phalanges. The Telmatobiini as conceived by Lynch (1978) is one of the three tribes of “lower” telmatobiines: the Calyptocephalellini, Batrachylini, and Telmatobiini. The latter tribe is paraphyletic with respect to the Batrachylini and is defined by primitive features. All members of the Telmatobiini have knobbed, rather than T-shaped terminal phalanges.

Shreve (1938) noted the presence of a cartilaginous sternum and “more-or-less” T-shaped terminal phalanges in the description of *Syrrhophus juninensis*. Examination of a cleared and stained specimen and radiographs of the holotype

have confirmed the phalangeal condition. Removal from the genus *Telmatobius* is justified because only knobbed terminal phalanges are present in that genus. Furthermore, the skulls of the several species of *Telmatobius* that were examined all have very long, recurved fang-like teeth, small, sickle-shaped nasals, long frontoparietals with medial borders that are parallel, the median ramus of the pterygoid abutting squarely on the otic capsule, and a reduced otic process of the squamosal.

In *Phrynopus juninensis*, the teeth are slightly pointed, but nevertheless are short and pedicellate. The nasals are rounded, and the frontoparietals are much shorter and diverge anteriorly. The median ramus of the pterygoid does not contact the otic capsule, and the otic process of the squamosal is well-developed.

Lastly, as Lynch (1978) noted, *juninensis* has no webbing on the feet; the many species of *Telmatobius* all have webbed feet. From the above evidence there is no basis for assignment to the genus *Telmatobius*.

According to Lynch (1971, 1975) the following genera of leptodactylids have T-shaped terminal phalanges: *Batrachyla*, *Crossodactylus*, *Eleutherodactylus*, *Hylodes*, *Lithodytes*, *Megaelosia*, some *Phrynopus* species, *Sminthillus*, *Syrrhophus*, *Thoropa*, and *Tomodactylus*. These genera can be separated from *Phrynopus juninensis* as follows (the states of *juninensis* are in parentheses): *Sminthillus* has partially fused epicoracoid cartilages (completely overlapping in *juninensis*). *Lithodytes*, a leptodactyline, has a bony sternum (cartilaginous). *Batrachyla* lacks a quadratojugal (present) and *Thoropa* has dilated sacral diapophyses (narrow). The Elosiinae (*Crossodactylus*, *Hylodes*, and *Megaelosia*) have dermal scutes present on the dorsal surfaces of the digits (absent). *Eleutherodactylus*, *Syrrhophus* and *Tomodactylus* have circumferential grooves on digital pads.

Moreover, the species *juninensis* fits easily among the species currently assigned to *Phrynopus*, as evidenced by the following: the presence of T-shaped terminal phalanges, lack of circumferential grooves on the digital pads, cartilaginous sternum, and non-fused epicoracoid cartilages. Lastly, on an admittedly subjective basis, the species looks very much like a *Phrynopus*, and not at all like most of the genera discussed above.

Distribution.—The species is known from the departments of Pasco and Junín in central Andean Peru.

Remarks.—The holotype (a non-reproductive male) agrees very well with Shreve's original description, and a redescription is not necessary. The dorsal markings of the holotype and two paratypes that were examined are noteworthy. There is a dark brown interorbital bar, to which is connected a middorsal bar that extends to the level of the suprascapula. There is also a dorsal x-shaped blotch. The other three non-typical MCZ specimens lack the dorsal markings.

The KU specimens have the same dorsal markings as the type-series. These frogs have a dark brown stripe along the canthus, upper eyelid, and supratympanic fold that is more evident than in the type-series. A dark suborbital bar is present and the supratympanic fold is very distinct. The ventral ground color in preservative is the same as that of the dorsum, with the exception of scattered tan flecks in the pectoral and chin regions. KU 138880 is an adult female with highly coiled oviducts.

The KU specimens were collected under rocks in a grassy area of the valley

floor. *Bufo spinulosus* and *Gastrotheca griswoldi* were collected sympatrically (W. E. Duellman field notes, 23 Jan 1971).

Other specimens examined.—PERU: Junín: Maraynioc (=Marainiyoc), 45 miles NE Tarma, 12,000', MCZ 24360 (cleared and stained), 24361; Jachahuanca, MCZ 24409–10; Pasco: 14 km SW Paucartambo, 3650 m, KU 138880–81.

Osteological material of *Telmatobius: arequipensis*, KU 164078; *barrioi*, KU 128880; *cirrhacelis*, KU 165989; *jelskii*, KU 164081; *hintoni*, KU 160190–91; *marmoratus*, KU 135903, 164079; *niger*, KU 131796; *peruvianus*, KU 162114; *schreiteri*, KU 160885; *simonsi*, KU 160139; sp., KU 164083, 181536.

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Literature Cited

- Cannatella, D. C. 1984. Two new species of the leptodactylid frog genus *Phrynopus*, with comments on the phylogeny of the genus.—Occasional Papers, Museum of Natural History, The University of Kansas 113:1–16.
- Gorham, S. W. 1966. Liste der rezenten Amphibien und Reptilien. Ascaphidae, Leiopelmatidea, Pipidae, Discoglossidae, Pelobatidae, Leptodactylidae, Rhinophrynidae.—Das Tierreich 85: xvi + 222 pp.
- Lynch, J. D. 1968. Systematic status of some andean leptodactylid frogs with a description of a new species of *Eleutherodactylus*.—Herpetologica 24(4):289–300.
- . 1969. Taxonomic notes on Ecuadorian frogs (Leptodactylidae: *Eleutherodactylus*).—Herpetologica 25(4):262–274.
- . 1970. A taxonomic revision of the leptodactylid frog genus *Syrrhophus* Cope.—The University of Kansas, Publications of the Museum of Natural History 20(1):1–45.
- . 1971. Evolutionary relationships, osteology, and zoogeography of leptodactyloid frogs.—Miscellaneous Publications, The University of Kansas Museum of Natural History 53:1–238.
- . 1972. Generic partitioning of the South American leptodactylid frog genus *Eupsophus* Fitzinger, 1843 (*Sensu lato*).—Bulletin of the Southern California Academy of Sciences 71(1): 2–11.
- . 1975. A review of the Andean leptodactylid frog genus *Phrynopus*.—Occasional Papers, Museum of Natural History, The University of Kansas 35:1–51.
- . 1978. A re-assessment of the telmatobiine leptodactylid frogs of Patagonia.—Occasional Papers, Museum of Natural History, The University of Kansas 72:1–57.
- Shreve, B. 1938. A new *Liolaemus* and two new *Syrrhophus* from Peru.—Journal of the Washington Academy of Sciences 28(9):404–407.

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